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# Factors Influencing the Helpfulness of Online Consumer Reviews

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**Abstract.** Online product review and rating is considered one of the most important factors influencing the purchasing behaviour. Today ecommerce sites received massive number of reviews and it becomes difficult for customers to read all the reviews. Online product review is one of widely researched area and many researchers have proposed models to predict review helpfulness in ecommerce sites. This main objective of this research is to find the determinants of online review helpfulness. 12,389 online reviews related to 25 brands of mobile phones were collected from amazon.in. The results shows that word count is positively associated with helpfulness of the review. Star rating, neutral opinion and negative opinion are negatively associated with helpfulness of the review.

**Keywords:** Online review, Helpfulness, Star Rating, Tendency, Sentiment Analysis, Text Mining, Amazon.

## 1 Introduction

Nowadays, most of the consumers are increasingly relying on opinions and experience of other consumers. Most of the online shopping websites in India like Amazon, Flipkart, Snapdeal etc., provides product review option for consumers to post their opinions and experiences of the product they have purchased recently. The ecommerce website like Amazon, Flipkart etc. receive thousands of reviews constantly for their popular products. Online product reviews are usually written by consumers to express their opinion and experience about their purchases. It has become common for consumers to search and read online product reviews before any online or offline purchase. Research survey shows that 93% of customers read online review before purchasing any product [1]. According to a survey, 62% of respondents in US mentioned that online customer reviews were very helpful in choosing the product [2]. A survey conducted in India about online reviews shows that 57% of consumers don't trust product reviews on eCommerce sites [3].

Most ecommerce sites give an option to consumers to grade or rate customer experience and satisfaction of using a product. Online product ratings and review is considered as one of the major factors that influences online users purchase behavior. Research shows that not all online consumer reviews are found to be helpful and have an influence on purchase decisions. Online reviews which are considered to be helpful

by consumers found to have stronger effect on consumer purchase decisions than other reviews [4], [5]. Review helpfulness shows if the review is giving useful product assessment and help in buying decisions. Hence it is important to identify the determinants which can make the review more helpful to the consumers. The purpose of this study is to find the determinants of online review helpfulness based on theoretical framework and empirical model.

## 2 Literature Review and Hypothesis

Good number of researchers have demonstrated that online reviews provide consumers relevant information about a product and influence consumers buying decisions [6], [7]. The previous research studies can be grouped into two categories based on research method. One of the categories is based on survey and experiments method of measuring review helpfulness [8]. The second category is based on collecting data from the e-commerce websites. Some previous research studies analyzed factors influencing the consumers to click helpfulness of the review. Baek, Shn and Choi researched using online consumer reviews collected from Amazon.com using web data crawler and found that review rating, reviewer's credibility and content of review influenced the helpfulness of reviews [5]. Biswas, Sengupta and Ganguly research findings shows the review title, review sentiments, star rating and temporal features predicts the count of helpful votes [7]. Lee, Trimi and Yang research shows that high star ratings and long review postings were found to be more helpful to consumers [9].

Some researchers studied the impact of online reviews on the purchase decisions [9]. Studies conduct by Li, Wu and Mai shows that star rating and sentiment is positively related to sales [10]. Mariani and Borghi research findings shows the online review helpfulness affect financial performance of a company [11]. Akbarabadi and Hosseini research studies shows that reviewer, and readability features found to strongly associated with helpfulness of review [12]. Lian, Schuckert and Law studies show that extreme rating and informative review are more likely to get the helpful votes [8]. Some of the widely studied factors influencing consumers helpfulness are total number of reviews, average rating score (star rating score), tendency and word count of the review. Statistical techniques used by previous research comes under, multiple regression, Tobit regression, multiple logit regression, vector regression, negative binomial regression, and partial least squares SEM. The most widely used platform to collect review was Amazon, Yelp, and Trip Advisor.

The present study focuses on studying the determinants of helpfulness. The independent variables used for this study are star rating, word count, tendency (positive, neutral, negative). The star rating is one of the widely used format to evaluate the product reviews by consumers and it is displayed near to the review. The tendency included in a review is defined as subjective attitudes expressed through affective word choice based upon a consumer's opinion or feeling as a result of using product. The conceptual model was developed to test the proposed hypotheses. The following hypothesis is proposed based on literature review.

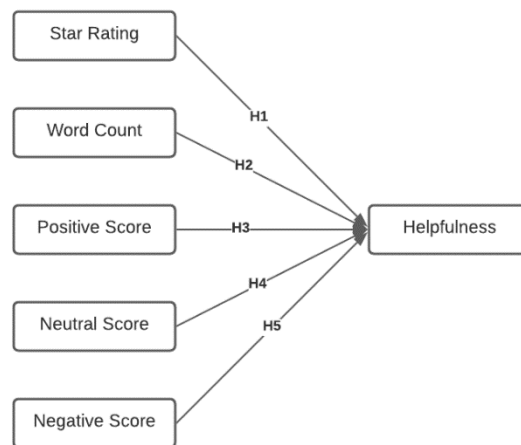
H<sub>1</sub>: Review Star rating positively affects the review helpfulness

H<sub>2</sub>: Review word count positively affects the review helpfulness

H<sub>3</sub>: Positive opinion expressed in a review positively affects the review helpfulness

H<sub>4</sub>: Neutral opinion expressed in a review positively affects the review helpfulness

H<sub>5</sub>: Negative opinion expressed in a review positively affects the review helpfulness



**Fig. 1.** Conceptual Model

### 3 Research Methodology

The aim of this research is to find the determinants of online review helpfulness. 73,151 number of online reviews of 25 smart phones brands were collected from Amazon.in. during August 2020 and only 12,389 reviews have at least one helpfulness vote. The analysis is only done to 12,389 online reviews as high number of zero counts in the overall sample. This approach was supported by many previous researchers [7]. This shows that 16.9 % of total online consumer reviews have at least one helpful vote.

Five brands in each price range are randomly selected. Python application was used to extract the reviews, creating a worksheet of review database, cleaning worksheet data, evaluating word books against WordNet to count the number of words in each review, determine the tendency, performing sentiment analysis and calculating the helpfulness rate a product or service. The sentiment analysis is one of the popular natural language processing (NLP) that automatically identifies and extract opinions in each text. The process of extracting opinion from online review is a form of text mining. This study uses Vader NLP algorithm to extract opinions found in an online review. These sentiments are categorized into three levels as positive, negative and neutral.

Many previous researchers have adopted linear regression for analyzing helpfulness [13]. This research adopted linear regression for predicting review helpfulness. The reviews with zero vote for helpfulness are excluded in the sample to investigate the determinants of helpfulness of the online review.

## 4 Results and Discussion

The descriptive data of all the variable is presented in the Table 1. The results shows that the average word count of reviews in the collected data set is 248.49 and average star rating is 3.73 for the 25 mobile phones. The average helpfulness vote from the online review is 9.71 and maximum review was given to one review for Apple mobile phone.

**Table 1.** Descriptive Statistics of the Variables

Variable	Mean	SD	Min	Max
Helpfulness Vote	9.71	102.27	1	5551
Star Rating	3.73	1.5937	1	5
Negative	0.08	0.1362	0	1
Neutral	0.67	0.2256	0	1
Positive	0.25	0.2431	0	1
No. of Characters	43.5	87.945	1	3271
No. of Words	248.49	501.87	2	18327

Table 2 lists the reviewer score which is also called as star rating. The reviewers provide a qualitative evaluation of a product by posting their subjective opinions on the review board. The average star rating is high for Oneplus and low for Mi. Overall mean of star rating is 3.73. Out of 12,389 reviews 2519 reviews was rated 1 star and 8.

**Table 2.** Distribution of Star Rating

Model	1	2	3	4	5	Average
Apple	292	41	59	157	855	3.88
Honor	158	49	81	228	605	3.96
Mi	74	14	10	21	63	2.92
Oneplus	489	142	262	569	2352	4.09
Oppo	161	32	70	148	371	3.69
Redmi	522	102	216	298	879	3.45
Samsung	649	174	210	294	527	2.93
Vivo	174	39	94	208	700	4.00
Total	2519	593	1002	1923	6352	3.73

This study selected reviews which has at least one vote for helpfulness of the review. Table 3 shows that certain reviews have maximum number of helpfulness vote. The average review helpfulness is found to be high for Apple mobile phones and low for Oneplus mobile phones.

**Table 3.** Number of Reviews and Helpfulness

Model	Count of Reviews	Max number of Helpfulness	Average
Apple	292	41	3.88
Honor	158	49	3.96
Mi	74	14	2.92
Oneplus	489	142	4.09
Oppo	161	32	3.69
Redmi	522	102	3.45
Samsung	649	174	2.93
Vivo	174	39	4.00
Total	2519	593	3.73

Table 4 shows the review length and helpfulness. Interestingly helpfulness votes are higher when the length of review is less than 500 words. This study shows that when length of the review is less than 1000 word count then helpful votes are found to be higher. The length of the review has more impact on helpfulness. When the length of reviews is more than 1000 words, there is a possibility of getting avoided as peoples don't spend much time reading full reviews.

**Table 4.** Review Length and Helpfulness

Number of Words	Number of Helpful Votes	Percentage
1 - 500	98713	82.09%
501 - 1000	17237	14.33%
1001-1500	4167	3.47%
1501-2000	125	0.104%
2001-2500	2	0.002%
2501-3000	0	0
3000-3500	6	0.005%
Total	2519	593

The sentiment score of reviews is classified as Positive, Neutral, and Negative. The negative opinions are higher percentage for Samsung and less for Oneplus. The sentiment score for the eight brands is presented in Table 5. Sentiment levels are indeed an extremely influential component in determining a reviews helpfulness vote count.

Customers tend to give higher star ratings when they also provide Negative or Critical reviews.

**Table 5.** Number of Reviews and Helpfulness

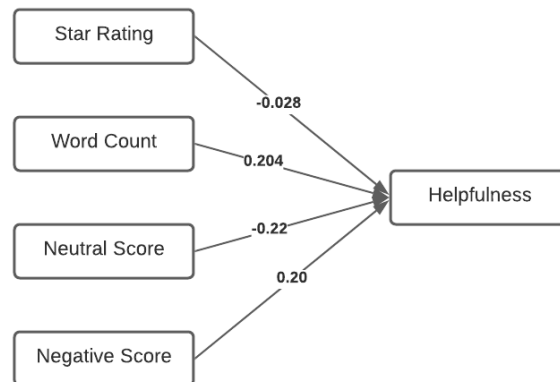
Model	Positive	Neutral	Negative
<b>Apple</b>	64	30	7
<b>Honor</b>	64	29	7
<b>Mi</b>	68	19	12
<b>Oneplus</b>	68	26	6
<b>Oppo</b>	66	26	8
<b>Redmi</b>	68	23	9
<b>Samsung</b>	69	19	13
<b>Vivo</b>	63	31	7

The linear regression was conducted, and r-square is found to be only 0.040 and ANOVA F value is 130.217 with Sig 0.0001. The regression results are presented in Table 6. Word count and negative opinion in the review shows the positively associated with helpfulness of the review. This finding is consistent with previous research findings [14]. Star rating and neutral opinion in the review shows negatively associated with helpfulness of the review. The findings of the research show the customers tend to click helpfulness of the review when the star rating given to the mobile phone is low and also when the word count in the review is high. The research also shows that the negative opinions presented in the review more likely to be clicked by customer as helpful review.

**Table 6.** Results of Regression Analysis

Variable	Standardized Coefficients	t Value	Sig
Constant		3.550	0.001
Star Rating	-0.028	-2.549	0.011
Word Count	0.204	22.579	0.001
Neutral Opinion	-0.022	-2.212	0.027
Negative Opinion	0.20	-2.181	0.031





**Fig. 2.** Final Model with Standardized Coefficients

## 5 Conclusion and Future Research

The present study investigated the determinants of helpfulness of the online reviews. The findings of this study shows that the review tendency, neutral and negative opinions affect the consumer to select the helpfulness of the review, but positive opinions did not show any effect on the consumer to select helpfulness of the review. The word count or the length of the review has more impact on helpfulness and has a stronger relationship. At the same time, the length of reviews should be less than 1000 words and when the review length is more than 1000 words, there is a possibility of getting avoided as peoples don't spend much time reading full reviews. It is necessary for the consumers to write reviews less than 1000 words as it encourages consumers to read and valuate the review as helpful. This study also found the review's tendency is perceived as more helpful for check the mobile phones in ecommerce site.

The present study investigated the determinants of helpfulness of the online reviews. The findings of this study shows that the review tendency, neutral and negative opinions affect the consumer to select the helpfulness of the review, but positive opinions did not show any effect on the consumer to select helpfulness of the review. The word count found to be positively associate to helpfulness of the review. The research finding could help the ecommerce companies to display the helpful reviews on the top which will help the company to increase their sales.

This study also has few limitations like the sample used for this research was selected based on condition that the review should have at least one star rating. This study collected data related to 25 brands of mobile phones. Future research can be extended to other products and comparative studies on online reviews can be conducted. Previous studies on online consumer review focused more on quantitative review contents like word count and star rating. Future research can include other review characteristics like

emotions, verb counts, type of word, type of product etc. The consumer involvement in evaluating the review may also depend on the reviewer. Future research can be conducted to do a detailed analysis on the effect of reviewer profile.

## References

1. Diana Kaemingk. Online reviews statistics to know in 2021. *XM Blog* <https://www.qualtrics.com/blog/online-review-stats/> last accesses 2021/11/18 (2020).
2. Statista. Online reviews - Statistics & Facts. <https://www.statista.com/topics/4381/online-reviews/> , last accessed 2021/08/28 (2021).
3. Localcircles. Fake Product Review Ratings on ecommerce sites. <https://www.localcircles.com/a/press/page/fake-product-review-ratings-on-ecommerce-sites-survey#.YWwfNdIBzrA>, last acced 2021/09/08 (2017).
4. Chen, P.-Y., Dhanasobhon, S. & Smith, M. D. All Reviews are Not Created Equal: The Disaggregate Impact of Reviews and Reviewers at Amazon.Com. *SSRN Electron. J.* (2011) doi:10.2139/ssrn.918083.
5. Baek, H., Ahn, J. & Choi, Y. Helpfulness of online consumer reviews: Readers' objectives and review cues. *International Journal of Electronic Commerce* vol. 17 (2012).
6. Liu, Y. & Hu, H. fen. Online review helpfulness: the moderating effects of review comprehensiveness. *Int. J. Contemp. Hosp. Manag.* **33**, (2021).
7. Biswas, B., Sengupta, P. & Ganguly, B. Your reviews or mine? Exploring the determinants of "perceived helpfulness" of online reviews: a cross-cultural study. *Electron. Mark.* (2021) doi:10.1007/s12525-020-00452-1.
8. Liang, S., Schuckert, M. & Law, R. How to improve the stated helpfulness of hotel reviews? A multilevel approach. *Int. J. Contemp. Hosp. Manag.* **31**, (2019).
9. Lee, S. G., Trimi, S. & Yang, C. G. Perceived Usefulness Factors of Online Reviews: A Study of Amazon.com. *J. Comput. Inf. Syst.* **58**, (2018).
10. Li, X., Wu, C. & Mai, F. The effect of online reviews on product sales: A joint sentiment-topic analysis. *Inf. Manag.* **56**, (2019).
11. Mariani, M. M. & Borghi, M. Online Review Helpfulness and Firms' Financial Performance: An Empirical Study in a Service Industry. *Int. J. Electron. Commer.* **24**, (2020).
12. Akbarabadi, M. & Hosseini, M. Predicting the helpfulness of online customer reviews: The role of title features. *Int. J. Mark. Res.* **62**, (2020).
13. Park, S., Chung, S. & Lee, S. The effects of online product reviews on sales performance: Focusing on number, extremity, and length. *J. Distrib. Sci.* **17**, (2019).
14. Choi, H. S. & Leon, S. An empirical investigation of online review helpfulness: A big data perspective. *Decis. Support Syst.* **139**, (2020).